



SAFETY HEALTH AND
ENVIRONMENTAL AFFAIRS

MAY 06 1993

ORIGINAL

MATERIAL SAFETY DATA SHEET

PRODUCT

TRI-ACT 1830 INHIBITOR

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

SECTION 1 PRODUCT IDENTIFICATION

TRADE NAME: TRI-ACT 1830 INHIBITOR

DESCRIPTION: An aqueous solution of cyclohexylamine, morpholine and diethylaminoethanol

NFPA 704M/HMIS RATING: 3/3 HEALTH 2/2 FLAMMABILITY 0/0 REACTIVITY 0 OTHER
0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme

SECTION 2 HAZARDOUS INGREDIENTS

Our hazard evaluation has identified the following chemical ingredient(s) as hazardous under OSHA's Hazard Communication Rule, 29 CFR 1910.1200. Consult Section 14 for the nature of the hazard(s).

INGREDIENT(S)	CAS #	APPROX. %
Cyclohexylamine	108-91-8	10-20
Morpholine	110-91-8	1-5
Diethylaminoethanol	100-37-8	1-5

SECTION 3 PRECAUTIONARY LABEL INFORMATION

DANGER: Corrosive to tissue. Do not get in eyes, on skin, or on clothing. Wear goggles, face shield and rubber gloves when handling. Avoid breathing of vapor. Use with adequate ventilation. Do not take internally. Keep away from heat and open flame. Keep container closed when not in use.

Empty containers may contain residual product. Do not reuse container unless properly reconditioned.

SECTION 4 FIRST AID INFORMATION

EYES: Immediately flush for at least 15 minutes while holding eyelids open. Call a physician at once.

SKIN: Immediately flush with water for at least 15 minutes. For a large splash, flood body under a shower. Call a physician at once.

INGESTION: Do not induce vomiting. Give water. Call a physician at once.

INHALATION: Remove to fresh air. Treat symptoms. Call a physician at once. If breathing has stopped, give cardiopulmonary resuscitation (CPR). Administer oxygen. Call a physician at once.

NOTE TO PHYSICIAN: Based on the individual reactions of the patient, the



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SECTION 4 FIRST AID INFORMATION

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physician's judgment should be used to control symptoms and clinical condition.

CAUTION: If unconscious, having trouble breathing or in convulsions, do not induce vomiting or give water.

NOTE TO PHYSICIAN: Probable mucosal damage may contraindicate the use of gastric lavage. Measures against circulatory shock, respiratory depression and convulsions may be needed.

SECTION 5 HEALTH EFFECTS INFORMATION

PRIMARY ROUTE(S) OF EXPOSURE: Eye, Skin, Inhalation

EYE CONTACT: Corrosive to the eyes with possible permanent damage depending on the length of exposure and on the first aid action given.

SKIN CONTACT: Corrosive to the skin, possibly resulting in third degree burns depending on the length of exposure and on the first aid action given. Can cause allergic contact dermatitis in susceptible individuals.

INGESTION: Can cause kidney damage. Can be harmful.

INHALATION: Can be corrosive to the mucous membranes and the lungs. Can cause an allergic reaction in susceptible individuals.

SYMPTOMS OF EXPOSURE: A review of available data does not identify any symptoms from exposure not previously mentioned.

AGGRAVATION OF EXISTING CONDITIONS: A review of available data does not identify any worsening of existing conditions.

SECTION 6 TOXICOLOGY INFORMATION

ACUTE TOXICITY STUDIES: Acute toxicity studies have been conducted on this product along with toxicity studies on the hazardous ingredient(s) in Section 2. The results are shown below.

ACUTE ORAL TOXICITY (ALBINO RATS): LD50 = 1,819 mg/kg

95% Confidence Limit = 1,496 - 2,211 mg/kg

COMMENTS: All deaths occurred within 72-hours after test article administration. Signs of intoxication noted during the test included salivation, lacrimation, muscle tremors, irregular breathing, lethargy, ataxia and convulsions.



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SECTION 6 TOXICOLOGY INFORMATION

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Rating = Toxic by oral ingestion

ACUTE DERMAL TOXICITY (ALBINO RABBITS): LD50 = Greater than 2,000 mg/kg

COMMENTS: All animals survived a single dermal application of 2,000 mg/kg applied to their shaven back (intact site, 24-hour occluded contact). No signs of systemic intoxication were observed during the study. Local skin reactions characterized by redness, swelling, black discoloration, eschar formation, cracking and fissuring and finally desquamation were observed.

Rating = Essentially non-toxic by skin absorption

PRIMARY SKIN IRRITATION TEST (ALBINO RABBITS):

SKIN IRRITATION INDEX DRAIZE RATING: 8.0/8.0 Corrosive

COMMENTS: Application of 0.5 ml of product to a 6cm² site on the shaven back of each of a group of six albino rabbits (4-hour occluded contact) produced severe redness and swelling, blanching, black discoloration, eschar formation immediately upon removal of the occlusive dressing. Injury persisted unabated through 72-hours after which time the animals were euthanized.

PRIMARY EYE IRRITATION TEST (ALBINO RABBITS):

EYE IRRITATION INDEX DRAIZE RATING: 89.7/110.0 @ 1-hour, 94.7/110.0 @ 72-hours
Maximally irritating

COMMENTS: Instillation of 0.1 ml of product into the conjunctival sac of one eye of each of a group of six albino rabbits produced severe redness, swelling and discharge, iritis, corneal opacity and blistering of conjunctiva which did not quickly resolve. Animals were euthanized after 72-hours.

SKIN SENSITIZATION: Cyclohexylamine has been shown to cause an allergic reaction in experimental animals.

OTHER TOXICITY RESULTS: Mutagenicity tests on morpholine provided the following results: Ames was negative; sister chromatid exchange was equivocal; cell transformation was positive; mouse lymphoma was weakly positive and rat hepatocyte/DNA repair was negative. A similar battery was run on cyclohexylamine with inconclusive results. Diethylaminoethanol is nonmutagenic in the Ames test using Salmonella strains TA98, 100, 1535 and 1537 with and without metabolic activation.

CHRONIC TOXICITY RESULTS: A two year rat inhalation study with morpholine was negative for cancer. A one year feeding study in Beagle dogs at dose levels



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SECTION 6 TOXICOLOGY INFORMATION

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of 500 and 1,000 ppm of diethylaminoethanol showed no significant effects.

SECTION 7 PHYSICAL AND CHEMICAL PROPERTIES

COLOR:	Clear amber	FORM:	Liquid	
DENSITY:			8.2 lbs/gal.	
SOLUBILITY IN WATER:			Completely	
SPECIFIC GRAVITY:			0.99 @ 77 Degrees F	ASTM D-1298
pH (NEAT) =			12	pH (at 1%) 10.9
VISCOSITY:			4 cps @ 77 Degrees F	ASTM E-70
FREEZE POINT:			26 Degrees F	ASTM D-2983
FLASH POINT:			133 Degrees F (PMCC)	ASTM D-1177
				ASTM D-93

NOTE: These physical properties are typical values for this product.

SECTION 8 FIRE AND EXPLOSION INFORMATION

FLASH POINT: 133 Degrees F (PMCC) ASTM D-93

EXTINGUISHING MEDIA: Based on the NFPA guide, use dry chemical, foam, carbon dioxide or other extinguishing agent suitable for Class B fires. Use water to cool containers exposed to fire. For large fires, use water spray or fog, thoroughly drenching the burning material.

UNUSUAL FIRE AND EXPLOSION HAZARD: May evolve NOx under fire conditions.

SECTION 9 REACTIVITY INFORMATION

INCOMPATIBILITY: N-nitrosamines, many are cancer causing agents to laboratory animals, may be formed when certain amines are mixed with nitrous acid, organic or inorganic nitrites or atmospheres with high nitrous oxide concentrations.

Avoid contact with strong oxidizers (eg. chlorine, peroxides, chromates, nitric acid, perchlorates, concentrated oxygen, permanganates) which can generate heat, fires, explosions and the release of toxic fumes.

THERMAL DECOMPOSITION PRODUCTS: In the event of combustion CO, CO2, NOx may be formed. Do not breathe smoke or fumes. Wear suitable protective equipment.

SECTION 10 PERSONAL PROTECTION EQUIPMENT

RESPIRATORY PROTECTION: If it is possible to generate significant levels of vapors or mists, a NIOSH approved or equivalent respirator is recommended.



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SECTION 10 PERSONAL PROTECTION EQUIPMENT

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For large spills, entry into large tanks, vessels or enclosed small spaces with inadequate ventilation, a pressure-demand, self-contained breathing apparatus is recommended.

VENTILATION: General ventilation is recommended. Additionally, local exhaust ventilation is recommended where vapors, mists or aerosols may be released.

PROTECTIVE EQUIPMENT: Wear impermeable gloves, boots, apron and a face shield with chemical splash goggles. Examples of impermeable gloves available on the market are neoprene, nitrile, PVC, natural rubber, viton and butyl (compatibility studies have not been performed). A full slicker suit is recommended if gross exposure is possible.

The availability of an eye wash fountain and safety shower is recommended.

If clothing is contaminated, remove clothing and thoroughly wash the affected area. Launder contaminated clothing before reuse.

SECTION 11 SPILL AND DISPOSAL INFORMATION

IN CASE OF TRANSPORTATION ACCIDENTS, CALL THE FOLLOWING 24-HOUR TELEPHONE NUMBER (708-920-1510)

SPILL CONTROL AND RECOVERY:

Small liquid spills: Contain with absorbent material, such as clay, soil or any commercially available absorbent. Shovel reclaimed liquid and absorbent into recovery or salvage drums for disposal. Refer to CERCLA in Section 14.

Large liquid spills: Dike to prevent further movement and reclaim into recovery or salvage drums or tank truck for disposal. Refer to CERCLA in Section 14.

For large indoor spills, evacuate employees and ventilate area. Those responsible for control and recovery should wear the protective equipment specified in Section 10.

DISPOSAL: If this product becomes a waste, it meets the criteria of a hazardous waste as defined under the Resources Conservation and Recovery Act (RCRA) 40 CFR 261. Hazardous Waste D001.

As a hazardous liquid waste, it must be solidified with stabilizing agents



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(such as sand, fly ash, or cement) so that no free liquid remains before disposal to a licensed industrial waste landfill (Hazardous Waste Treatment, Storage and Disposal facility). A hazardous liquid waste can also be incinerated in accordance with local, state, and federal regulations.

SECTION 12 ENVIRONMENTAL INFORMATION

AQUATIC DATA:

96 hour static acute LC50 to Rainbow Trout = 240 ppm

95% Confidence Limit of 96 hour LC50 = 180 - 320 ppm

96 hour no observed effect concentration is estimated at 180 ppm based on no mortality or abnormal effects.

TOXICITY RATING: Slightly toxic

96 hour static acute LC50 to Bluegill Sunfish = 240 ppm

95% Confidence Limit of 96 hour LC50 = 180 - 320 ppm

96 hour no observed effect concentration is estimated at 1,000 ppm based on no mortality or abnormal effects.

If released into the environment, see CERCLA in Section 14.

SECTION 13 TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME/HAZARD CODE - CORROSIVE LIQUID, N.O.S.
CORROSIVE MATERIAL UN 1760
CONTAINS - CYCLOHEXYLAMINE

SECTION 14 REGULATORY INFORMATION

The following regulations apply to this product.

FEDERAL REGULATIONS:

OSHA'S HAZARD COMMUNICATION RULE, 29 CFR 1910.1200:

Based on our hazard evaluation, the following ingredients in this product are hazardous and the reasons are shown below.

Cyclohexylamine - Corrosive to eyes/skin, combustible



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SECTION 14 REGULATORY INFORMATION

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Morpholine - Corrosive to eyes/skin

Diethylaminoethanol - Corrosive to eyes, skin irritant

Cyclohexylamine = TWA 10 ppm, 41 mg/m³ (skin) ACGIH/TLV

Morpholine = TWA 20 ppm, 71 mg/m³ ACGIH/TLV

Diethylaminoethanol = TWA 10 ppm, 48 mg/m³ (skin) ACGIH/TLV

Cyclohexylamine = TWA 10 ppm, 40 mg/m³ (skin) OSHA/PEL

Morpholine = TWA 20 ppm, STEL 30 ppm (skin) OSHA/PEL

70 mg/m³, 105 mg/m³ OSHA/PEL

Diethylaminoethanol = TWA 10 ppm, 50 mg/m³ (skin) OSHA/PEL

CERCLA/SUPERFUND, 40 CFR 117, 302:

Notification of spills of this product is not required.

SARA/SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986

(TITLE III) - SECTIONS 302, 311, 312 AND 313:

SECTION 302 - EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355):

This product contains cyclohexylamine, which is listed in Appendix A and B as an Extremely Hazardous Substance. The statutory threshold planning quantity for this substance is 10,000 pounds.

A release of 9 pounds of product will require a notification to your State Emergency Response Commission.

You may also be required to notify the NATIONAL RESPONSE CENTER

- See CERCLA/SUPERFUND, above.

SECTIONS 311 and 312 - MATERIAL SAFETY DATA SHEET REQUIREMENTS (40 CFR 370):

Our hazard evaluation has found this product to be hazardous. The product should be reported under the following EPA hazard categories:

XX Immediate (acute) health hazard

— Delayed (chronic) health hazard

XX Fire hazard

— Sudden release of pressure hazard

— Reactive hazard

SECTION 313 - LIST OF TOXIC CHEMICALS (40 CFR 372):

This product does not contain ingredients on the List of Toxic Chemicals.

TOXIC SUBSTANCES CONTROL ACT (TSCA):

The chemical ingredients in this product are on the 8(b) Inventory List



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SECTION 14 REGULATORY INFORMATION

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(40 CFR 710).

FOOD AND DRUG ADMINISTRATION (FDA):

Federal Food, Drug and Cosmetic Act:

When use situations necessitate compliance with FDA regulations, this product is acceptable under 21 CFR 173.310 Boiler Water Additives. The following use limitations apply: Maximum dosage of product not to exceed 90 ppm in the steam. This product may not be used where the steam produced will contact milk or milk products.

U. S. DEPARTMENT OF AGRICULTURE (USDA):

USDA Inspection and Grading Programs - Food Safety and Inspection Service:

This product is authorized by USDA for use in federally inspected meat and poultry plants. Authorized use is under category G6.

The following limitations apply: Maximum dosage of product not to exceed 90 ppm in the steam.

This product has been certified as KOSHER/PAREVE for year-round use EXCEPT FOR THE PASSOVER SEASON by the CHICAGO RABBINICAL COUNCIL.

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA), 40 CFR 261 SUBPART C & D:
Consult Section 11 for RCRA classification.

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15
(formerly Sec. 307), 40 CFR 116 (formerly Sec. 311):
None of the ingredients are specifically listed.

CLEAN AIR ACT, Sec. 111 (40 CFR 60), Sec. 112 (40 CFR 61, 1990 Amendments):
This product contains the following ingredients covered by the Clean Air Act:

Cyclohexylamine - Section 111
Morpholine - Section 111

STATE REGULATIONS:

CALIFORNIA PROPOSITION 65:

This product does not contain any chemicals which require warning under California Proposition 65.

MICHIGAN CRITICAL MATERIALS:

This product does not contain ingredients listed on the Michigan Critical Materials Register.

STATE RIGHT TO KNOW LAWS:



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SECTION 14 REGULATORY INFORMATION

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The following ingredient(s) are disclosed for compliance with State Right To Know Laws:

Cyclohexylamine	108-91-8
Diethylaminoethanol	100-37-8
Morpholine	110-91-8
Water	7732-18-5

INTERNATIONAL REGULATIONS:

This is a WHMIS controlled product under The House of Commons of Canada Bill C-70. The product contains the following substance(s), from the Ingredient Disclosure List or has been evaluated based on its toxicological properties, to contain the following hazardous ingredient(s):

Chemical Name	CAS #	% Concentration Range
Cyclohexylamine	108-91-8	10-20
Morpholine	110-91-8	1-5
Diethylaminoethanol	100-37-8	1-5

SECTION 15 ADDITIONAL INFORMATION

None

SECTION 16 USER'S RESPONSIBILITY

This product material safety data sheet provides health and safety information. The product is to be used in applications consistent with our product literature. Individuals handling this product should be informed of the recommended safety precautions and should have access to this information. For any other uses, exposures should be evaluated so that appropriate handling practices and training programs can be established to ensure safe workplace operations. Please consult your local sales representative for any further information.

SECTION 17 BIBLIOGRAPHY

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DATE CHANGED: 07/09/92

DATE PRINTED: 05/03/93